



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

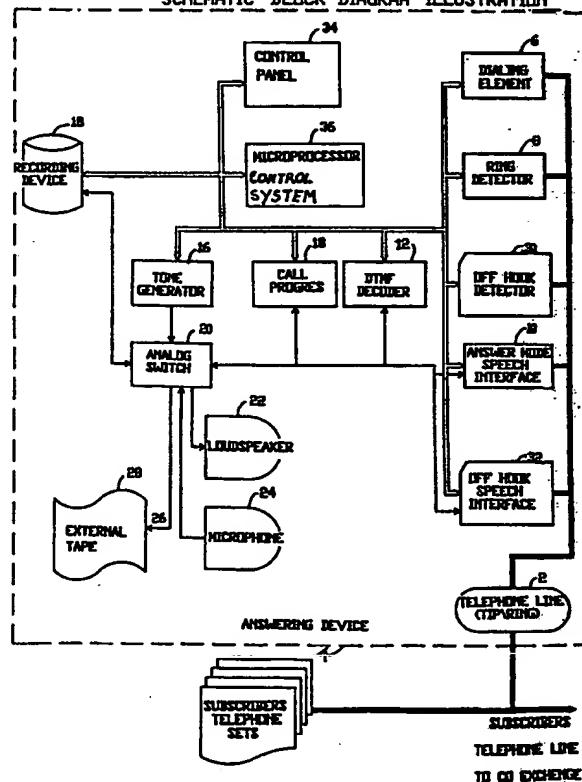
(51) International Patent Classification 5 : <b>H04M 1/64</b>	<b>A1</b>	(11) International Publication Number: <b>WO 93/16542</b> (43) International Publication Date: <b>19 August 1993 (19.08.93)</b>
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(21) International Application Number: **PCT/US93/01080**(22) International Filing Date: **4 February 1993 (04.02.93)**(30) Priority data:  
**07/832,172**      **6 February 1992 (06.02.92)**      **US**(71) Applicant: **RAVIV, Roni [IL/US]; 8 Harriman's Keep, Irvington, NY 10733 (US).**(71)(72) Applicants and Inventors: **DRUCKMAN, Gil [IL/IL]; 10 Patai Street, 69 973 Tel Aviv (IL). ABIRI, Amnon [IL/IL]; 5 Patai Street, 69 973 Tel Aviv (IL).**(74) Agents: **BARISH, Benjamin, J. et al.; Benjamin J. Barish & Co., c/o Victoria Sheinbein, 2940 Birchtree Lane, Silver Spring, MD 20906 (US).**(81) Designated States: **AT, AU, BB, BG, BR, CA, CH, DE, DK, ES, FI, GB, HU, JP, KP, KR, LK, LU, MG, MN, MW, NL, NO, PL, RO, RU, SD, SE, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, SN, TD, TG).****Published**  
*With international search report.*(54) Title: **MESSAGE RECORDING MACHINE**

## (57) Abstract

A message recording machine includes an off-hook detector (30) for detecting an off-hook condition of a subscriber's telephone line (2), and a control system which enables any party, when the off-hook condition is detected in the subscriber's telephone line, to actuate the recording machine to record a message by a calling party or called party. The recording machine is capable of recording messages in a plurality of message boxes, and the control system enables either the caller, or a party at the called subscriber's telephone, to select one of the plurality of messages boxes in which a message is to be recorded, and also from which a message is to be played back.

SCHEMATIC BLOCK DIAGRAM ILLUSTRATION



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MESSAGE RECORDING MACHINE

The present invention relates to message recording machines, and particularly to telephone recording machines, sometimes called electronic secretaries, connectible to  
5 subscriber telephone lines for recording messages by callers.

Telephone recoding machines have come into widespread use for recording messages when the called party is not available, or does not wish, to answer the telephone.  
10 In many instances, a subscriber's telephone may service a number of people, for example different persons in an office, or different members of a family, all of whom may be receiving messages by callers. In many cases, the telephone subscriber's line has a number of extensions at different  
15 locations, which extensions may normally be allocated to different parties serviced by the subscriber's telephone (e.g., in an office), or may be available for all the parties serviced by the telephone (e.g., in the home). The conventional telephone recording machine indicates that one  
20 or more messages have been recorded, but does not indicate to whom the messages are intended. Therefore, each member of the office or household serviced by a subscriber's telephone has to play back all the recorded messages in order to assure not to miss one or more that may have been  
25 intended for that person. This not only results in a substantial waste of time, but also in the unnecessary dissemination of messages to persons not intended to receive them. Moreover, after one such party has played back all the recorded messages, the party may inadvertently erase all  
30 the messages, including those that may have been intended for other parties. Further, no indication is provided whether the messages have been heard.

In addition, when the telephone is answered by a party not intended by the caller, the answering party may be  
35 requested to convey a message to the intended party. This requires the answering party to record the message and to deliver it to the party to whom the message was intended.

Not only is this inconvenient to the party answering the telephone, but also may result in an error in the message to be transmitted to the intended party, or in a failure altogether to deliver the message.

5           An object of the present invention is to provide a message recording machine having advantages in the above respects.

          According to the present invention, there is provided a message recording machine connectible to a  
10   subscriber's telephone line having a subscriber's telephone connected thereto for recording messages by callers, comprising: recording means for recording messages by callers; a ring detector for detecting ringing of the subscriber's telephone when the subscriber's telephone is  
15   on-hook; and a control system controlled by the ring detector for actuating the recording means for recording a message by a caller; characterized in that: the recording machine further includes an off-hook detector for detecting an off-hook condition of the subscriber's telephone, and  
20   control means enabling a called party or a calling party, when the off-hook detector detects the off-hook condition in the subscriber's telephone, to actuate the recording means to record a message by a calling party.

          According to further features in the preferred  
25   embodiment of the invention described below, the recording means is capable of recording messages in a plurality of message boxes; and the control means includes selector means enabling either the caller, or a party at the subscriber's telephone, to select one of the plurality of message boxes  
30   in which a message is to be recorded.

          According to additional features in the described preferred embodiment, the machine further includes an indicator for each of the message boxes and controlled by the control system so as to be energized when a message is  
35   recorded in its respective message box.

          A telephone recording machine constructed in accordance with the foregoing features enables the machine to perform all or substantially all the normal functions of

existing telephone recording machines, but adds a number of additional important functions. Thus, if a party answering the telephone is not the one requested by the caller, the answering party may not only so inform the caller, but may also actuate the machine so that the message for the intended party will be recorded directly from the caller. In addition, if no one answers the telephone, the caller may not only leave a message as in the conventional telephone answering machine, but may also designate the party to receive the message, by selecting the message box number. Further, the various parties serviced by the subscriber's telephone can easily see whether any message has been recorded for that particular party, and if so, select for playback only the message or messages intended for that party. Each such party can also selectively erase, repeat, etc., any or all of the messages recorded for that particular party.

Further features and advantages of the invention will be apparent from the description below.

The invention is herein described, by way of example only, with reference to the accompanying drawings, wherein:

Fig. 1 is a block diagram illustrating one form of telephone recording machine constructed in accordance with the present invention;

Fig. 2 illustrates the control panel in the telephone recording machine of Fig. 1;

Fig. 3 is a flow chart illustrating the three basic modes of operation of the telephone recording machine of Figs. 1 and 2;

Figs. 4 and 4a, taken together, are a flow chart illustrating the on-hook mode of operation of Fig. 3;

Fig. 5 is a flow chart illustrating the off-hook mode of operation of Fig. 3; and

Fig. 6 is a flow chart illustrating the playback mode of operation of Fig. 3.

### Overall System

The telephone recording machine illustrated in Fig. 1 is connectible to the telephone line 2 in the conventional manner to which the subscriber's telephone 4 is connected. The recording machine includes a dialler 6, ring detector 8, a speech interface 10 for the answering mode, a DTMF (double-tone multi-frequency) decoder 12 which detects the dial code dialled by the caller, a call progress unit 14 which detects a speech and dial or busy tone, and a tone generator 16 which generates a "beep" to indicate when a message may be recorded. The messages are recorded in a recorder unit 18. The illustrated system further includes an analog switch 20 which controls a speaker 22, microphone 24 and a tap 26 for an external tape unit 28, if desired.

The above-described units are generally the same, and operate in substantially the same manner, as in a conventional recording machine, and therefore further details of their construction and operation are not set forth herein.

The novel telephone recording machine illustrated in the drawings in accordance with the present invention includes an off-hook detector 30 and an off-hook speech interface 32. In addition, it includes a control panel 34, more particularly illustrated in Fig. 2. The telephone recording machine is controlled by a microprocessor 36 which is preprogrammed to perform its various functions as will be described more particularly below.

The off-hook detector 30 detects the off-hook condition of the telephone, i.e., the lifting of the telephone handset off-hook by a party at the subscriber's telephone line. This condition is detected by the change in the DC voltage level on the telephone line, and the condition is signalled to the microprocessor 36. As will be described more particularly below, when this condition is detected and signalled to the microprocessor, the microprocessor enables the answering party at the subscriber's telephone to actuate the recording device 18, and thus to enable the caller to record directly a message

in the recording device.

The recording device 18 is one capable of recording the messages in a plurality of message boxes. Thus, each party serviced by the subscriber's telephone may have a box number allocated to that respective party, so that messages addressed directly to that party may be recorded in that party's specific box number. The recording device 18 would also include a General box, to record all messages not addressed to a particular party identified by a specific box number.

The recording device 18 is preferably a RAM (random access memory) to enable messages to be recorded and to be retrieved in a random access manner. RAMs today have very large memory capacities such that they can be used for this purpose. However, if larger memory capacities are needed for any particular application, other types of recording devices may be used, e.g., magnetic tape, disks, etc.

#### The Control Panel 34

Control panel 34 is more particularly illustrated in Fig. 2. It includes a plurality of depressible selector keys 41a-41n, each identifying a separate message box number assigned to the various persons serviced by the subscriber's telephone. One message box, e.g., 42n, is a general box to receive messages not addressed to any particular person. It will be appreciated that instead of identifying the boxes by numbers, they could also be identified by names, letters, or other symbols.

The control panel 34 further includes a plurality of indicators 42a--42n, one for and next to each of the selector keys 41a--41n. Whenever a message has been recorded in a message box number, its indicator 42a--42n is energized to indicate this fact; and when a box number is selected for playing back its message or messages, its respective indicator is blinked to indicate this fact. A nameplate 43a--43n is provided for each message box number to identify the party for the respective box number.

As will be described more particularly below, a particular box number may be selected for playback of its message or messages by merely depressing the respective key 41a--41n. An additional key 44 is provided which may be  
5 depressed for playing back all the messages from all the boxes.

Besides the indicator lamps 42a--42n, indicating the respective boxes identified by the keys 41a--41n, the control panel 34 includes a display 50 which displays the  
10 total number of messages recorded in a selected box, and a second display 51 which displays the message number in a selected box. For example, if the box identified by key 41a is selected, there will appear in display 50 the total number of messages recorded for that box number. A  
15 particular message number may be then selected for playback by operating either Forward key 52 or Back key 53.

Whenever a message is selected for playback, various other operations, sometimes called "service operations", may be selected with respect to the particular  
20 message. For example, after the message has been played back, it may be erased; this can be done by depressing Erase key 54. On the other hand, it may be desired to preserve the message against erasing, in which case the disable/enable Erase key 55 may be depressed. The first  
25 depression of that key disables (prevents) erasing; whereas the subsequent depression of that key enables (permits) erasing that message. Display 51 not only displays the message number being played back, but also if that message is protected against erasure.

30 If it is desired to repeat a message, the Repeat key 56 may be depressed; if it is desired to produce a "pause" in the playback of the message, the Pause key 57 may be depressed; if it is desired to jump-back a predefined interval, the Jump-back key 58 may be depressed; and if it  
35 is desired to end the playback of messages, either at the end of a message or in the middle of a message, the End key 59 may be depressed.



The control panel 34 includes a further key 60, called the OGM (outgoing message) key. This key is depressed whenever the answering machine is to be placed in the on-hook mode, i.e., to play back to the caller a message pre-recorded by the subscriber, as in a conventional answering machine.

#### The Modes of Operation (Fig. 3)

The microprocessor 36 included in the recording machine is pre-programmed to enable the machine to perform the three modes of operation illustrated in Fig. 3. Thus, the system is normally in the idle mode, indicated at 90, but may be activated to: (1) the on-hook mode 100 when the subscriber's telephone is on-hook and a ring is received (2) the off-hook mode 200 when the subscriber's telephone is off-hook, or (3) the playback mode 300 when a party at the subscriber's recording machine wishes to play back messages by operating the control panel 34. The above three modes of operation are more particularly illustrated by the flow charts of Figs. 4-6, respectively.

#### The On-Hook Mode 100 (Fig. 4)

This mode of operation is illustrated in Fig. 4. When the subscriber's telephone number is dialled, and the telephone is on-hook and ringing (box 101), and the OGM (outgoing message) has been played (box 102), the caller may record a message in the answering machine at the subscriber's telephone, or may play back a message recorded therein. As in a conventional telephone answering machine, when ringing is detected a caller may not only record messages, but may also play back previously recorded messages, by transmitting a code (e.g., his personal "beeper") via the telephone line.

In this case, however, the caller may dial a particular code, e.g., a "star" (\*), to indicate that the caller wishes to record a message, or a "sharp" (#), to indicate the callers wishes to play back one or more messages previously recorded in the subscriber's answering

machine (box 103).

If a "star" is dialled, indicating the caller wishes to record a message, the system determines whether a particular box number has been dialled to identify the particular party at the subscriber's telephone number to receive the message (box 104). For example, there may be 10 parties each capable of receiving messages at the subscriber's recording machine. To select the appropriate box number, the caller would dial the number identifying the box to receive the message.

When a box number has been so dialled, the system selects the box number to receive the message (105), sounds a beep to indicate when the message may be recorded (box 106), and then records the message (box 107). The end of the message time (box 108) may be determined by any of the conditions a-d indicated by box 108 in Fig. 4, namely: (a) no speech; (b) dial/busy tone; (c) time run out; and (d) depressing End key (59, Fig. 2).

When it has been determined that the message has ended (box 108), a check is made to determine whether the message was indeed a speech message, as distinguished from a dial or busy tone. If the message was indeed a speech message (box 109), the appropriate indicator 42a--42n is illuminated (box 111) and the message counter counting the messages for that particular box is advanced (112).

If the caller dialled the "playback" code (#), the caller must also introduce an identification code (e.g., by using the caller's personal "beeper") and dial a selected box number; in such case, the messages for the selected box number are played back (box 122).

The system then determines whether the caller has also requested one of the special services indicated by the service keys 52-58 of the control panel 34. The microprocessor 36 is preprogrammed such that when such a service is requested by the caller (who is remote from the control panel 34 at the subscriber's telephone), such a service can be requested and identified by dialling a code, corresponding to the service keys 52-58, from the caller's

telephone handset. For example, if the caller wishes to erase a selected message after playback, the caller would dial the code corresponding to the Erase key 54 in the control panel 34, whereupon the microprocessor effects the erasure of the respective message in the same manner it would erase it when the Erase key 54 is depressed (during the playback mode 300, as will be described more particularly below with respect to the flow chart of Fig. 6).

10 If the caller does not dial either the recording code (e.g., "\*"), or the playback code (e.g., "#"), the message will be recorded in the general box, rather than in one of the specific box numbers.

As shown in the flow chart of Fig. 4, the system will be reset and returned to the idle mode (90) whenever the subscriber's telephone goes on-hook, or receives a dial or busy tone (box 132), or, if the caller has dialled the playback code (box 103), whenever the time runs out without the caller dialling the caller's personal identification code or the identification of the box number whose messages are to be played back.

#### Off-Hook Mode 200 (Fig. 5)

As shown in Fig. 5, the microprocessor 36 is preprogrammed to perform this mode whenever the subscriber's telephone goes off-hook (box 201); that is, someone answers the telephone call by lifting the handset.

If the caller wishes to talk to a person other than the one answering the telephone, either the caller or answering party may condition the system for recording the message by the caller and also for selecting the box number in which the message is to be recorded. For example, if the party answering the telephone wishes to do this, the answering party informs the calling party that a message may be recorded for the intended party following the beep; at that time, the answering party dials the "recording" code (e.g., "\*") and also the box number, following which the beep is sounded to inform the caller that a message may now

be recorded. The caller may then record the message, and as soon as the end of the message is determined (box 206) in the manner described with respect to the flow chart of Fig. 4, the appropriate indicator 42a--42n is illuminated and the appropriate message counter is advanced. As shown by the legends next to box 208, the End of Message conditions are the same as in Fig. 4 (box 108) with the addition of the "on-hook" condition.

The recording code (box 202) and the box number code (box 203) may also be dialled directly by the caller to record a message for a selected box number. The flow chart illustrated in Fig. 5 also permits the caller to record a plurality of messages each for a different box number. This condition of permitting the caller to record one or more messages is maintained until the system goes on-hook (boxes 210, 212).

#### Playback Mode 300 (Fig. 6).

The playback mode illustrated in Fig. 6 is operative whenever a person at the subscriber's telephone wishes to play back one or more messages recorded by the answering machine. Thus, each party at the subscriber's telephone can easily determine, from the control panel 34, whether any message has been recorded in the answering machine for the respective party by merely seeing whether the indicator lamp 43a--43n for the respective box number has been energized.

If the party sees that lamp 43a--43n for that parties box number has been energized, the party depresses the key 41a--41n for the respective box number (box 300). This causes the respective indicator 42a--42n to blink, to indicate that box number is now being addressed. The total number of messages in that box are displayed in display 50 of the control panel, and the first message in that box is indicated by the message number in display 51. The first message in the selected box is then played back (box 303, Fig. 6).

After the message has been played back, the party may request any one of the special services indicated by keys 52-58 in the control panel 34 of Fig. 2. For example, if the party wishes to play back the next message, the party  
5 would depress the forward key 52, in which case the second message number would appear in display 51 and would be played back. If the party wishes to erase the played-back message, Erase key 54 may be depressed for this purpose; and so on with the other keys 52-58.

10 This mode is terminated whenever the end key 59 is depressed, or whenever the last message has been read out for the selected box number.

While the invention has been described with respect to one preferred embodiment, it will be appreciated  
15 that this is set forth merely for purposes of example, and that many other variations, modifications and applications of the invention may be made.

WHAT IS CLAIMED IS:

1. A message recording machine connectible to a subscriber's telephone line having a subscriber's telephone connected thereto for recording messages by callers, comprising: recording means for recording messages by callers; a ring detector for detecting ringing of the subscriber's telephone when the subscriber's telephone is on-hook; and a control system controlled by said ring detector for actuating said recording means for recording a message by a caller; characterized in that: said recording machine further includes an off-hook detector for detecting an off-hook condition of the subscriber's telephone line, and control means enabling a called party or a calling party, when said off-hook detector detects said off-hook condition in the subscriber's telephone, to actuate said recording means to record a message by a calling party.

2. The machine according to Claim 1, wherein: said recording means is capable of recording messages in a plurality of message boxes;

and said control means includes selector means enabling either the calling party, or the called party, to select one of said plurality of message boxes in which a message is to be recorded.

3. The machine according to Claim 2, wherein said machine further includes an indicator for each of said message boxes and controlled by said control system so as to be energized when a message is recorded in its respective message box.

4. The machine according to Claim 3, wherein said machine further includes playback selector means for selecting the message box number whose recorded messages are to be played back.

5. The machine according to Claim 4, wherein said indicators are light sources carried by a control panel, and said playback selector means includes depressible keys, one for and adjacent each of said light sources.

6. The machine according to Claim 5, wherein said control panel further includes an Erase key effective, when depressed, to erase a message in a selected message box.

7. The machine according to Claim 5, wherein said control panel further includes a Repeat key effective, when depressed, to repeat the playback of a message in a selected message box.

8. The machine according to Claim 5, wherein said control panel further includes a display for displaying the total number of messages recorded in a selected message box.

9. The machine according to Claim 5, wherein said control panel further includes message-selector means for selecting for playback any one of a plurality of messages in a selected message box.

10. The machine according to Claim 5, wherein said control means is effective to cause blinking of the indicator for the message box selected for playback.

11. The machine according to Claim 1, wherein said control system, and its recorder-actuator means, are in a microprocessor preprogrammed so as to be responsive to a code dialled either by the caller when the subscriber's telephone is on-hook, or by a party at the subscriber's telephone when the telephone is off-hook, to actuate said recording means to record a message by the caller.

12. The machine according to Claim 11, wherein said microprocessor is also preprogrammed to be responsive to another code dialled either by the caller when the subscriber's telephone is on-hook, or by a party at the subscriber's telephone when the telephone is off-hook, to actuate said recording means to play back a recorded message.

FIG. 1. SCHEMATIC BLOCK DIAGRAM ILLUSTRATION

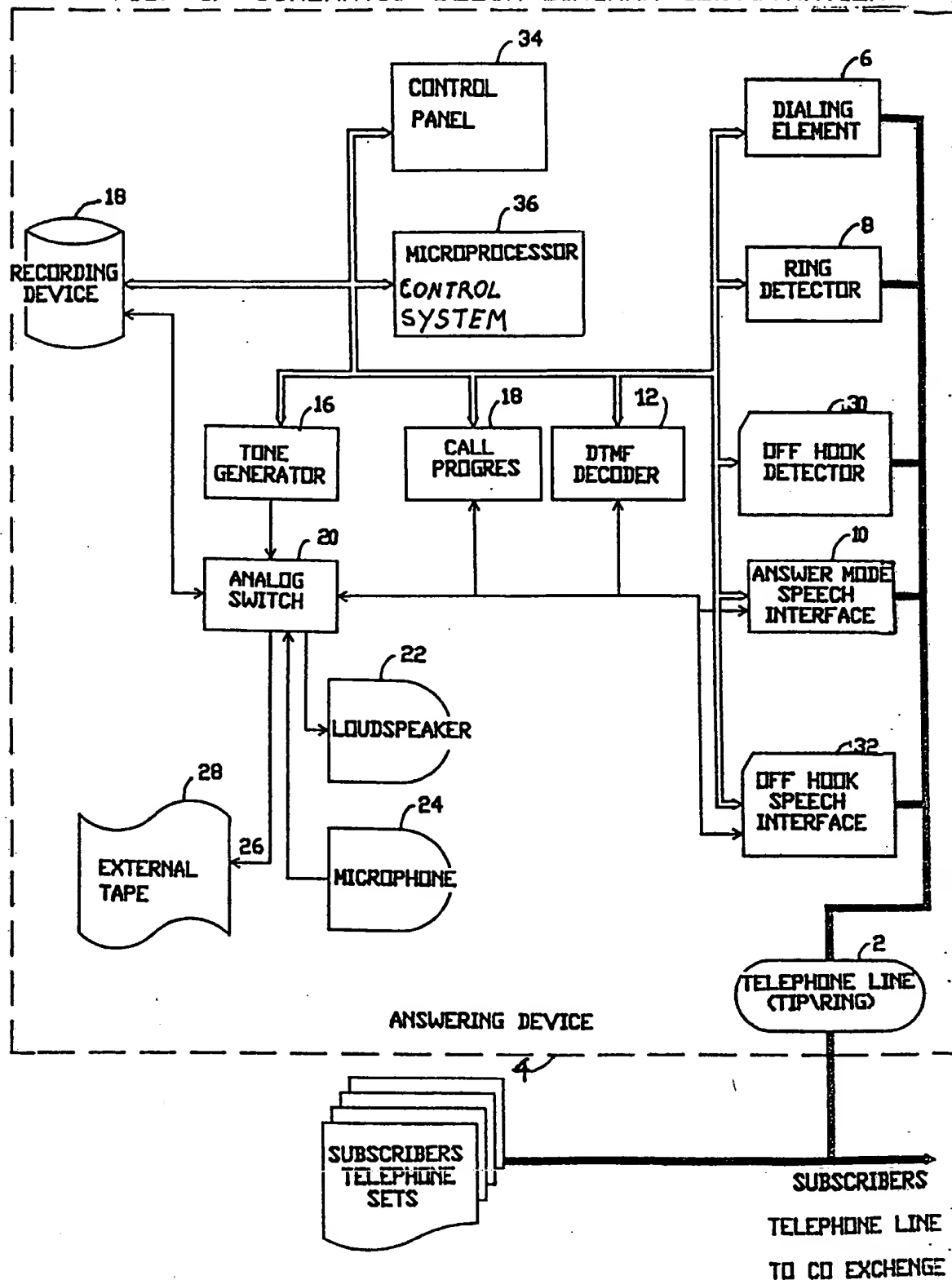




FIG. 2. CONTROL PANEL ILLUSTRATION

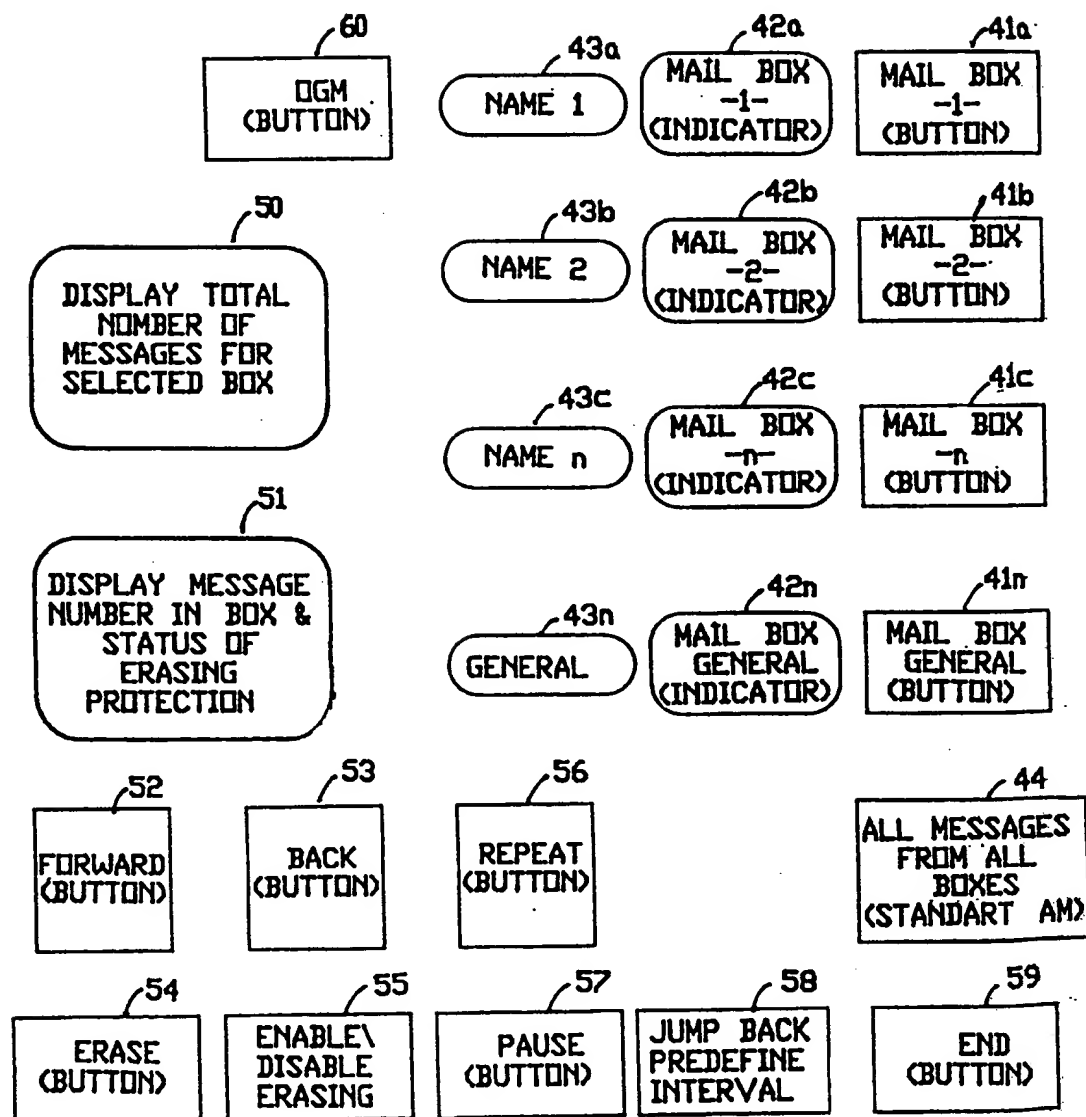


FIG. 3. ILLUSTRATION OF BASIC OPERATIONAL MODES

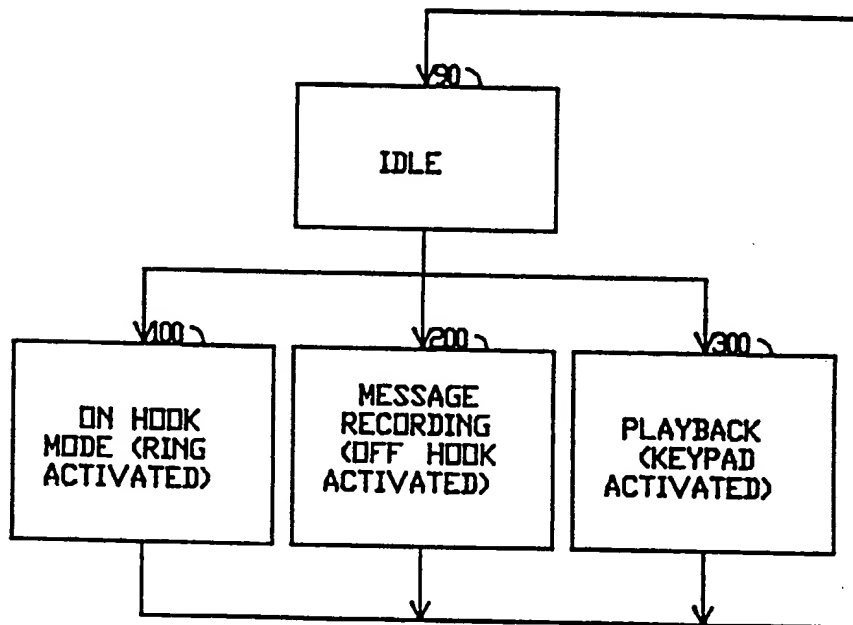
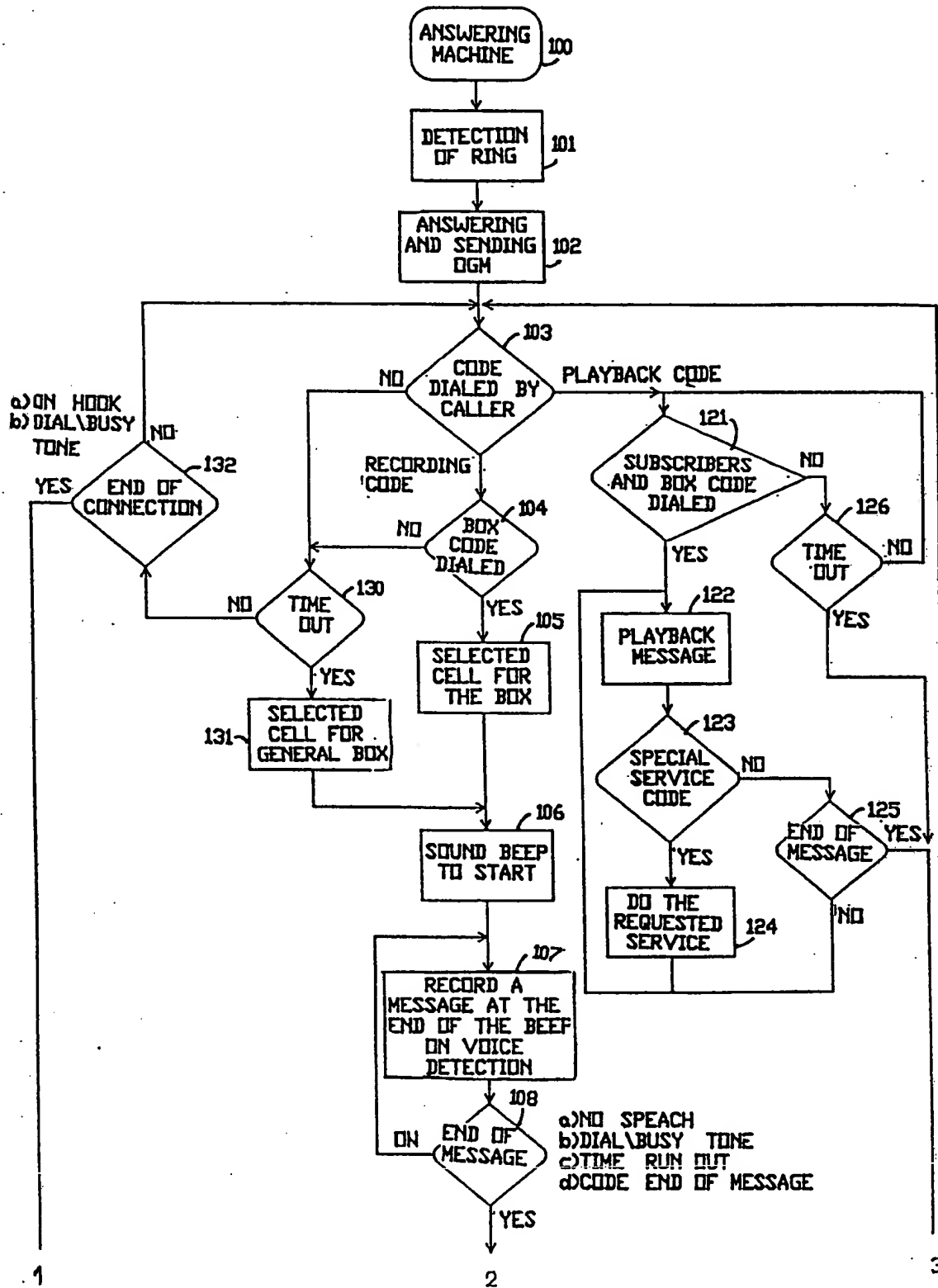


FIG. 4. ILLUSTRATION OF ON HOOK MODE



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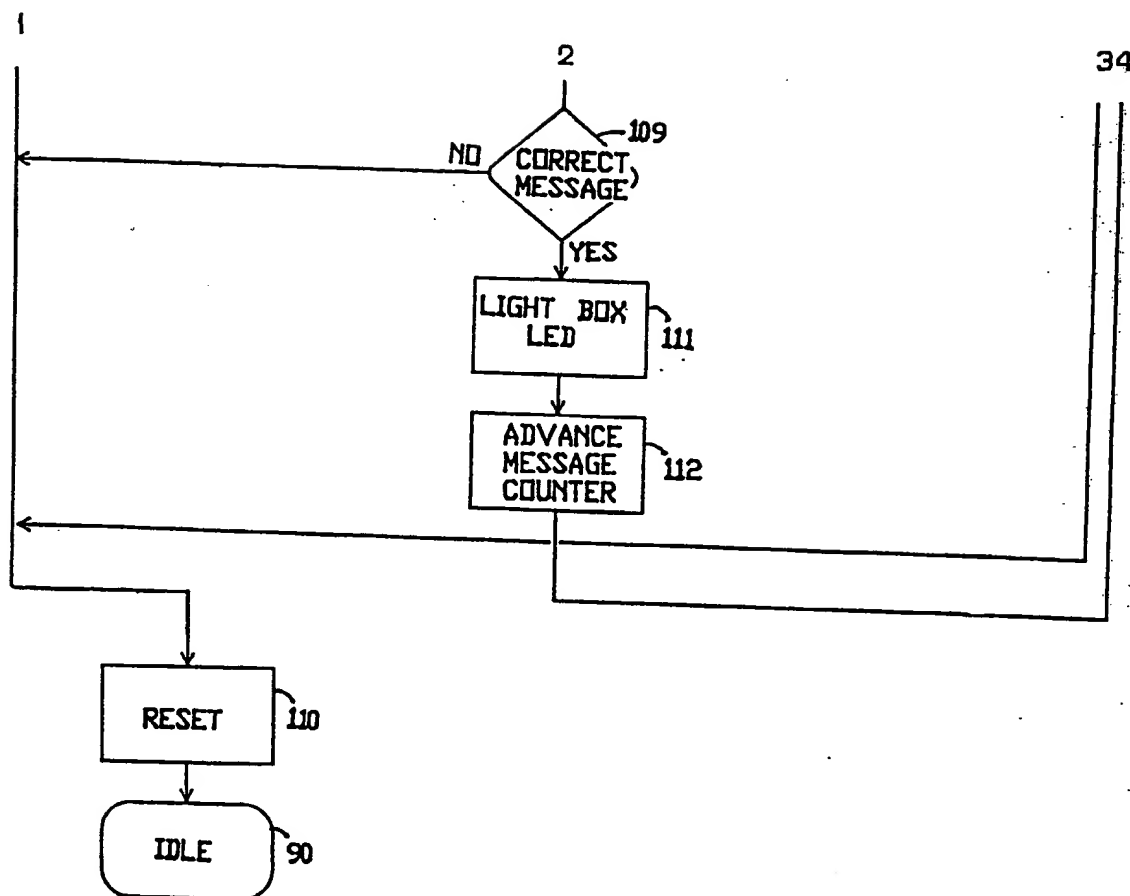
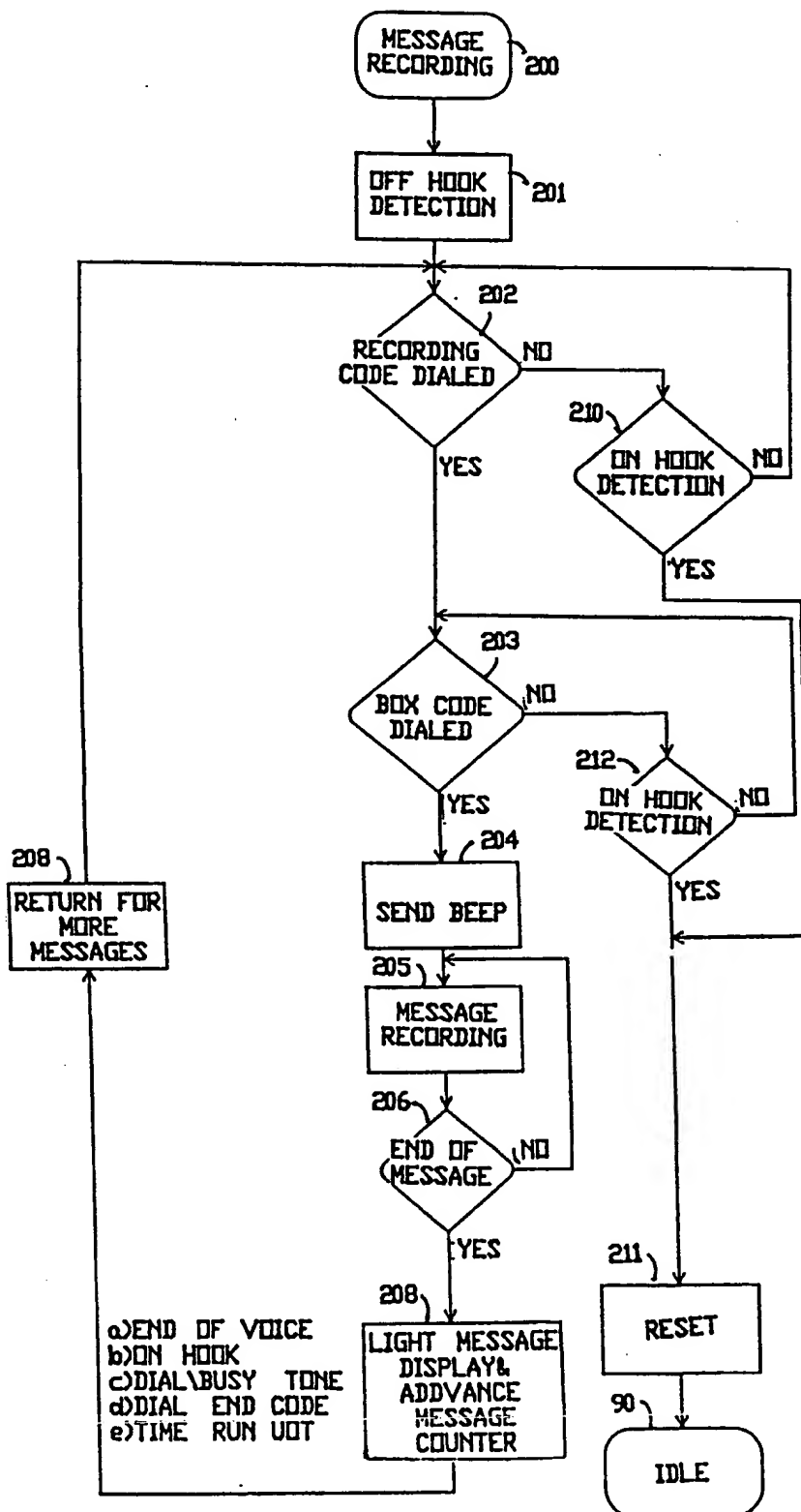


FIG. 4a

SUBSTITUTE SHEET

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FIG 5. ILLUSTRATION OF OFF HOOK MODE (THE INVENTION)



SUBSTITUTE SHEET



## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US93/01080**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(5) :H04M 1/64

US CL :379/67,76,77,88

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 379/74,82,85,89

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US,A, 4,903,289 (Hashimoto) 20 February 1990 See column 6, lines 33-40 and column 7, lines 62 to column 8, line 2.	1,11 and 12
Y	US,A, 4,847,889 (Eswaran) 11 July 1989 See column 5, lines 43-65.	2
Y	US,A, 4,571,458 (Bond) 18 February 1986 See column 2, lines 12-21.	2
Y	US,A, 4,518,827 (Sagara) 21 May 1985 See column 5, lines 26-43 and column 5, line 55 to column 6, line 34.	2

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	T	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be part of particular relevance	X	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US93/01080

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US,A, 4,951,307 (Willard) 21 August 1990 See column 3, line 22 to column 4, line 52 and column 12, lines 16-43.	2
Y	US,A, 4,885,763 (O'Brien et al.) 05 December 1989 See Figure 10 and column 9, lines 60-65.	3 and 4
A	US,A, 4,833,704 (Hashimoto) 23 May 1989 See column 2, lines 27-39 and column 7, lines 54-58.	1
A,P	US,A, 5,121,422 (Kudo) 09 June 1992 See entire document.	1-12
A	US,A, 4,998,272 (Hawkins, Jr., et al.) 05 March 1991 See entire document.	1-12
A,P	US,A, 5,093,854 (Sucato) 03 March 1992 See entire document.	1-12